

APPENDIX I—UNDERTANK LEAK DETECTION AND SUBGRADE PROTECTION

I.1 Scope and Background

I.1.1 This appendix provides acceptable construction details for the detection of product leaks through the bottoms of aboveground storage tanks, and provides guidelines for tanks supported by grillage.

Note: API supports a general position of installation of a Release Prevention Barrier (RPB) under new tanks during initial construction. An RPB includes steel bottoms, synthetic materials, clay liners, and all other barriers or combination of barriers placed in the bottom of or under an aboveground storage tank, which have the following functions: (a) preventing the escape of contaminated material, and (b) containing or channeling released material for leak detection.

- **I.1.2** Several acceptable construction details are provided for detection of leaks through the tank bottom and details for tanks supported by grillage (see Figures I-1 through I-11). Alternative details or methods may be used if agreed upon by the tank owner and Manufacturer, provided the details or methods satisfy the requirements of I.2.
- **I.1.3** The tank owner shall determine whether the undertank area is to be constructed for leak detection. If leak detection is required, the owner shall specify the method or methods to be employed.

I.1.4 The bottoms of aboveground storage tanks may leak as a result of product side corrosion, soil side corrosion, or a combination of both. The extent of product side corrosion can be detected using standard inspection techniques during an internal inspection, but determining the nature and extent of soil side corrosion is more difficult. Therefore, in certain services and tank locations, it may be desirable to provide for undertank monitoring of leakage through the tank bottom plates.

I.1.5 For additional information on the use of internal linings to prevent internal bottom corrosion, see API RP 652. Similarly, see API RP 651 for guidelines and requirements relating to preventing corrosion from the soil side of the bottom plate.

I.1.6 When the appropriate tank foundation design is being selected, it is important to consider the environmental and safety regulatory implications of leakage of tank contents into the containment space below the tank bottom. Specifically, the contamination of permeable material such as sand used as a floor support may constitute the generation of a hazardous waste. The treatment or disposal costs of such contaminated material must be determined.

I.1.7 The requirements for secondary containment as it relates to diked areas and impoundments are not within the scope of this appendix.

I.2 Performance Requirements

The following general requirements shall be satisfied for all leak detection systems:

- a. Leaks through the tank bottom shall be detectable by observation at the tank perimeter. If a leak is detected, it shall be collected.
- b. The use of electronic sensors for the detection of vapors and liquids is acceptable; however, the requirements of Item a above shall be satisfied. Any such sensor shall be fail-safe or have provision for calibration.

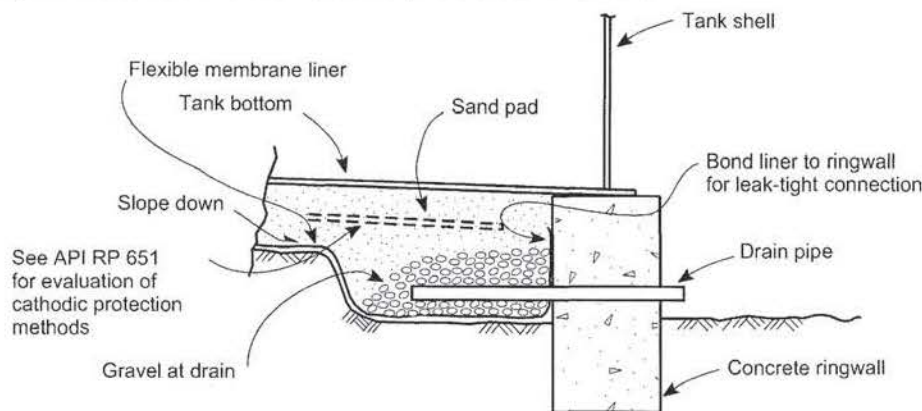


Figure I-1—Concrete Ringwall with Undertank Leak Detection at the Tank Perimeter (Typical Arrangement)